WHAT IS CLAIMED IS:

1. An optical apparatus for guiding EUV radiation to a predetermined surface, comprising:

a radiation source which supplies EUV radiation having a certain dispersion angle;

an illumination optical system having a reflective integrator which forms a secondary radiation source having a predetermined shape based on the EUV radiation supplied from the radiation source; and

a projection optical system which is arranged in an optical path between a reflective mask and the predetermined surface and which forms an image of the reflective mask onto the predetermined surface based on the EUV radiation from the reflective mask,

wherein the secondary radiation source having the predetermined shape has a shape which is selected from the group consisting of a substantially circular shape, an annular shape, and a multipolar shape.

2. The optical apparatus of claim 1, wherein a numerical aperture of the projection optical system is changeable.

3. The optical apparatus of claim 2, wherein a numerical aperture of the illumination optical system is changeable.

4. The optical apparatus of claim 3, further comprising an annular radiation beam converting unit which is arranged in an optical path between the radiation source and the reflective integrator.

5. The optical apparatus of claim 3, further comprising a multipolar radiation beam converting unit which is arranged in an optical path between the radiation source and the reflective integrator.

6. The optical apparatus of claim 5, wherein the multipolar shape comprises a quadrupolar shape.

7. The optical apparatus of claim 3, further comprising a unit that changes a radiation beam which is incident on the reflective integrator.

8. The optical apparatus of claim 3, wherein the projection optical system comprises six mirrors.

9. The optical apparatus of claim 1, wherein the secondary radiation source having the predetermined shape is changed based on information about a type of the reflective mask.

10. The optical apparatus of claim 1, wherein the illumination optical system and the projection optical system are mask side non-telecentric.

11. A method of guiding EUV radiation to a predetermined surface, comprising the steps of:

supplying EUV radiation having a certain dispersion angle;

forming a secondary radiation source having a predetermined shape using a reflective integrator, based on the supplied EUV radiation;

guiding the EUV radiation from the reflective integrator to a reflective mask;

forming an image of the reflective mask using a projection optical system based on the EUV radiation from the reflective mask; and

selecting a shape of the secondary radiation source from the group consisting of a substantially circular shape, an annular shape, and a multipolar shape.

12. The method of claim 11, further comprising the step of changing a coherence factor.

13. The method of claim 11, further comprising the step of converting the EUV radiation having the certain dispersion angle to an annular beam.

14. The method of claim 13, wherein the converting step is performed before guiding the EUV radiation to the reflective integrator.

15. The method of claim 11, further comprising the step of converting the EUV radiation having the certain dispersion angle to a multipolar beam.

16. The method of claim 15, wherein the converting step is performed before guiding the EUV radiation to the reflective integrator.

17. The method of claim 16, wherein the multipolar shape comprises a quadrupolar shape.

18. The method of claim 11, wherein the selecting step changes the shape of the secondary radiation source based on information about a type of the reflective mask.